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10/581,089	05/31/2006	Tetsuro Mizushima	128197	9465

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EXAMINER	
HIGGINS, GERARD T	

ART UNIT	PAPER NUMBER
1794	

MAIL DATE	DELIVERY MODE
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/581,089	MIZUSHIMA ET AL.	
	Examiner	Art Unit	
	GERARD T. HIGGINS	1794	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE _3_ MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on _24 September 2009_.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) _1-6,8-13,15-17,19-26 and 29_ is/are pending in the application.

4a) Of the above claim(s) _20-24_ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) _1-6,8-13,15-17,19,25,26 and 29_ is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _07/28/2009_.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application

6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

1. The amendment filed 09/24/2009 has been entered. Currently, claims 1-6, 8-13, 15-17, 19-26, and 29 are pending, claims 20-24 are withdrawn, and claims 7, 14, 18, 27, and 28 are cancelled.

Claim Rejections - 35 USC § 103

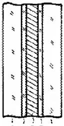
2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 1, 6, 8, 11, 15, and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yoshinaga et al. (JP 01-231082) in view of Chandross et al. (EP 0938027), Loy et al. ("Substituent effects on the sol-gel chemistry of Organotrialkoxysilanes," **2000**, *12*, 3624-3632), and Hiruma et al. (4,863,831), as evidenced by Travnicek (3,996,187).

With regard to claim 1, Yoshinaga et al. disclose the device of Figure 1.

第 1 図



It discloses an optical component comprised of a holographic film **3**, which is equivalent to applicants' optical material layer, an index of refraction matching fluid **2** covering the holographic film, which may be silicone oil (an organosilicon resin layer), and then a substrate **1** and solid component **1**, which are both glass substrates; however, it does not specifically set forth the materials of the holographic recording layer.

Chandross et al. teach an improved holographic recording medium with a hybrid inorganic-organic matrix (Abstract). The matrix precursor is $R_nM(OR`)_{4-n}$ wherein R is an organic moiety such as aryl or alkyl, R` is a lower alkyl up to 4 carbon atoms, n is 1 or 2, and M is Si [0009], [0014]-[0018], and [0022]. The matrix precursor is hydrolyzed to form the matrix, which reads on applicants' optical material layer and the holographic film of Yoshinaga et al. The organic moieties on the matrix material are disclosed as increasing the free volume/porosity and also increasing compatibility with the photoactive organic monomers, which form the recorded data [0011].

Loy et al. teach the formation of organic/inorganic hybrid materials of the type $RSi(OR`)_3$ where R` is ethyl and R may be a variety of organic groups, including methyl, chloromethyl, and chloromethylphenyl (pg. 3624). The chloromethyl and

chloromethylphenyl are shown to react more slowly than the methyl in Table 5 (pg. 3628). The pore diameters for the chloromethyl is significantly larger than that for the methyl substituted silanes as shown in Tables 7 and 8 (pg. 3631). The gels were the most transparent when R was hydrogen, methyl, or chloromethyl (pg. 3631, right column). Loy et al. also disclose that gels may be formed using organotrialkoxysilanes that are typically used for coupling agents (pg. 3632, left column).

Hiruma et al. disclose silane coupling agents that increase adhesion between photocurable coatings and an underlying substrate, including chloropropyl trimethoxysilane (col. 3, line 61 to col. 4, line 66).

Since Otaki et al. Chandross et al., Loy et al., and Hiruma et al. are drawn to inorganic-organic matrix materials; it would have been obvious to one having ordinary skill in the art at the time the invention was made to substitute the known holographic recording materials of Chandross et al. as the recording layer **3** of Yoshinaga et al. The results of which would have been completely predictable to one having ordinary skill in the art of holography; further, Chandross et al. provide a motivation in that their inorganic-organic hybrid materials are disclosed as increasing the free volume/porosity and also increasing compatibility with the photoactive organic monomers, which form the recorded data [0011].

It would then have been obvious to have replaced the methyltriethoxysilane of Chandross et al. with chloromethyltriethoxysilane as taught by Loy et al. with a reasonable expectation of forming a useful organic-inorganic matrix holographic recording medium based upon the transparency disclosed by Loy et al.; furthermore, it

would have been obvious to have used the chloropropyl group in place of the chloromethyl group as taught by Hiruma et al. because they are both recognized as trialkoxysilane coupling agents.

Lastly, one of ordinary skill would understand that an index of refraction liquid of silicone oil would be completely appropriate for the inorganic-organic hybrid recording materials of Chandross et al. as they have similar structural characteristics and would therefore intrinsically have similar indices of refraction. This is further evidenced in Travnicek, which states that various silicone oils are known to have refractive indices of 1.43 to 1.49 (col. 2, line 55 to col. 3, line 9.

With regard to the limitation that the optical material layer has a "thickness unevenness and the organosilicon resin layer is coated on the surface of the dried optical material layer and the total thickness of the organosilicon resin layer and the dried optical material layer is optically uniform," given the fact that Yoshinaga et al. in view of Chandross et al., Loy et al., and Hiruma et al. disclose the same materials that comprise applicants' optical material layer, and also given the fact that the references make the optical material layer in the same manner as applicants (i.e. coating on a substrate followed by drying); the Examiner deems the optical material layer of Yoshinaga et al. in view of Chandross et al., Loy et al., and Hiruma et al. will intrinsically display unevenness as claimed. Additionally, the fact that index of refraction matching fluid is present is to correct the unevenness to optically uniform is an intended use limitation. Intended use limitations are not dispositive of patentability; however, given the fact that Yoshinaga et al. in view of Chandross et al., Loy et al., and Hiruma et al.

disclose an optical material layer and the method of making said optical material layer as claimed, and also given the fact that they disclose an organosilicon resin layer as claimed; it is clear to the Examiner that the organosilicon resin layer will perform applicants' intended use.

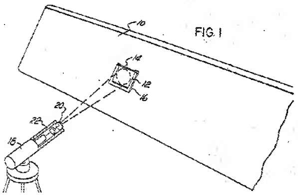
With regard to claims 6, 8, 11, and 15, the silicone oils of Yoshinaga et al. will intrinsically have an index of refraction that is approximately equal to or within 0.05 of the index of refraction of the inorganic-organic hybrid materials, [0046] and Travnicek values. The silicone oils are chosen to be an index of refraction matching layer, and therefore they will intrinsically satisfy the limitations of the abovementioned claims because when the optical material layer is comprised of more than one material the effective index of refraction will be a weighted average based on the molecular composition of the optical material layer. The silicone oil is chosen to be approximately the same as the effective/average refractive index of the optical material layer, which therefore means it will intrinsically be within the minimum and maximum indices of refraction; furthermore, it would have been obvious to one having ordinary skill in the art to vary the individual ratios of all the components in the optical material layer to arrive at an appropriate index of refraction that can be matched by an appropriate index of refraction matching layer.

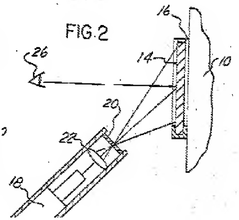
With regard to claim 19, the glass substrates **1** of Yoshinaga et al. are transparent to allow for recording onto the holographic film.

4. Claims 2 and 29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yoshinaga et al. (JP 01-231082) in view of Chandross et al. (EP 0938027), Loy et al. ("Substituent effects on the sol-gel chemistry of Organotrialkoxysilanes," **2000**, *12*, 3624-3632), and Hiruma et al. (4,863,831) as evidenced by Travnicek (3,996,187) as applied to claim 1 above, and further in view of Penn (3,897,995).

With regard to claim 2, Yoshinaga et al. in view of Chandross et al., Loy et al., and Hiruma et al. as evidenced by Travnicek teach all of the limitations of applicants' claim 1 in section 3 above; however, they fail to teach a spacer layer that surrounds the outer periphery of the optical material layer provided between the substrate and the solid component, the space being formed to have a thickness larger than that of the optical material layer.

Penn teaches the device of Figure 1 and 2.





The holographic recording material has a spacer **16** that is thicker than the optical material layer **14** and separates the substrate **12** and the solid component **10**. It is clear that it is thicker than the optical material layer from the Figure 2, and also from the

disclosure at col. 3, lines 52-67. The spacer surrounds the optical material layer on the outer periphery thereof.

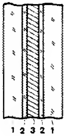
Since Yoshinaga et al. in view of Chandross et al., Loy et al., and Hiruma et al. as evidenced by Travnicek and Penn are all drawn to holographic recording materials; it would have been obvious to one having ordinary skill in the art at the time the invention was made to incorporate the spacer units of Penn into the holographic recording plate of Yoshinaga et al. in view of Chandross et al., Loy et al., and Hiruma et al. The results of the combination would have been predictable to one having ordinary skill in the art; further, each of the components would have performed the same in combination as they had separately. The motivation for doing so is to produce a holographic recording plate that had excellent parallelism between the optical recording material and the substrate. The use of spacers is well known in the art of holography; further, it is well-known to provide said spacers in order to establish a space to put the index of refraction matching layer seen in Yoshinaga et al.

With regard to claim 29, there must necessarily be a space present, no matter how minuscule, in between the outer periphery of the optical material layer and an inner periphery of the spacer. If there was no space present the spacer and the optical material would necessarily be connected. Given the fact that there is a space present, the Examiner deems there will also necessarily be a part of the organosilicon resin layer that will intercalate between the outer periphery of the optical material layer and an inner periphery of the spacer.

5. Claims 4, 9, 12, 16, and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yoshinaga et al. (JP 01-231082) in view of Chandross et al. (EP 0938027), Loy et al. ("Substituent effects on the sol-gel chemistry of Organotrialkoxysilanes," **2000**, *12*, 3624-3632), Hiruma et al. (4,863,831), and Penn (3,897,995) as evidenced by Travnicek (3,996,187).

With regard to claim 4, Yoshinaga et al. disclose the device of Figure 1.

第 1 図



They disclose an optical component comprised of a holographic film **3**, which is equivalent to applicants' optical material layer, an index of refraction matching fluid **2** covering the holographic film, which may be silicone oil (an organosilicon resin layer), and then a substrate **1** and solid component **1**, which are both glass substrates; however, they do not specifically set forth the materials of the holographic recording layer and they fail to teach a spacer layer that surrounds the outer periphery of the optical material layer provided between the substrate and the solid component, the space being formed to have a thickness larger than that of the optical material layer.

Chandross et al. teach an improved holographic recording medium with a hybrid inorganic-organic matrix (Abstract). The matrix precursor is $R_nM(OR`)_{4-n}$ wherein R is

an organic moiety such as aryl or alkyl, R` is a lower alkyl up to 4 carbon atoms, n is 1 or 2, and M is Si [0009], [0014]-[0018], and [0022]. The matrix precursor is hydrolyzed to form the matrix, which reads on applicants' optical material layer and the holographic film of Yoshinaga et al. The organic moieties on the matrix material are disclosed as increasing the free volume/porosity and also increasing compatibility with the photoactive organic monomers, which form the recorded data [0011].

Loy et al. teach the formation of organic/inorganic hybrid materials of the type $RSi(OR`)_3$ where R` is ethyl and R may be a variety of organic groups, including methyl, chloromethyl, and chloromethylphenyl (pg. 3624). The chloromethyl and chloromethylphenyl are shown to react more slowly than the methyl in Table 5 (pg. 3628). The pore diameters for the chloromethyl is significantly larger than that for the methyl substituted silanes as shown in Tables 7 and 8 (pg. 3631). The gels were the most transparent when R was hydrogen, methyl, or chloromethyl (pg. 3631, right column). Loy et al. also disclose that gels may be formed using organotrialkoxysilanes that are typically used for coupling agents (pg. 3632, left column).

Hiruma et al. disclose silane coupling agents that increase adhesion between photocurable coatings and an underlying substrate, including chloropropyl trimethoxysilane (col. 3, line 61 to col. 4, line 66).

Since Otaki et al. Chandross et al., Loy et al., and Hiruma et al. are drawn to inorganic-organic matrix materials; it would have been obvious to one having ordinary skill in the art at the time the invention was made to substitute the known holographic recording materials of Chandross et al. as the recording layer **3** of Yoshinaga et al. The

results of which would have been completely predictable to one having ordinary skill in the art of holography; further, Chandross et al. provide a motivation in that their inorganic-organic hybrid materials are disclosed as increasing the free volume/porosity and also increasing compatibility with the photoactive organic monomers, which form the recorded data [0011].

It would then have been obvious to have replaced the methyltriethoxysilane of Chandross et al. with chloromethyltriethoxysilane as taught by Loy et al. with a reasonable expectation of forming a useful organic-inorganic matrix holographic recording medium based upon the transparency disclosed by Loy et al.; furthermore, it would have been obvious to have used the chloropropyl group in place of the chloromethyl group as taught by Hiruma et al. because they are both recognized as trialkoxysilane coupling agents.

Lastly, one of ordinary skill would understand that an index of refraction liquid of silicone oil would be completely appropriate for the inorganic-organic hybrid recording materials of Chandross et al. as they have similar structural characteristics and would therefore intrinsically have similar indices of refraction. This is further evidenced in Travnicek, which states that various silicone oils are known to have refractive indices of 1.43 to 1.49 (col. 2, line 55 to col. 3, line 9).

With regard to the limitation that the optical material layer has a "thickness unevenness and the organosilicon resin layer is coated on the surface of the dried optical material layer and the total thickness of the organosilicon resin layer and the dried optical material layer is optically uniform," given the fact that Yoshinaga et al. in

view of Chandross et al., Loy et al., and Hiruma et al. disclose the same materials that comprise applicants' optical material layer, and also given the fact that the references make the optical material layer in the same manner as applicants (i.e. coating on a substrate followed by drying); the Examiner deems the optical material layer of Yoshinaga et al. in view of Chandross et al., Loy et al., and Hiruma et al. will intrinsically display unevenness as claimed. Additionally, the fact that index of refraction matching fluid is present is to correct the unevenness to optically uniform is an intended use limitation. Intended use limitations are not dispositive of patentability; however, given the fact that Yoshinaga et al. in view of Chandross et al., Loy et al., and Hiruma et al. disclose an optical material layer and the method of making said optical material layer as claimed, and also given the fact that they disclose an organosilicon resin layer as claimed; it is clear to the Examiner that the organosilicon resin layer will perform applicants' intended use.

Penn teaches the device of Figure 1 and 2.

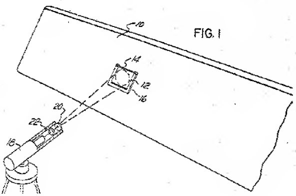


FIG. 1

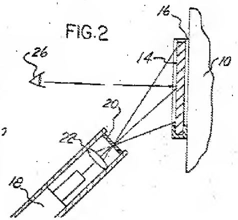


FIG.2

The holographic recording material has a spacer **16** that is thicker than the optical material layer **14** and separates the substrate **12** and the solid component **10**. It is clear

that it is thicker than the optical material layer from the Figure 2, and also from the disclosure at col. 3, lines 52-67. The spacer surrounds the optical material layer on the outer periphery thereof.

Since Yoshinaga et al. and Penn are drawn to holographic recording materials, it would have been obvious to one having ordinary skill in the art at the time the invention was made to incorporate the spacer units of Penn into the holographic recording plate of Yoshinaga et al. in view of Chandross et al., Loy et al., and Hiruma et al. The results of the combination would have been predictable to one having ordinary skill in the art; further, each of the components would have performed the same in combination as they had separately. The motivation for doing so is to produce a holographic recording plate that had excellent parallelism between the optical recording material and the substrate. The use of spacers is well known in the art of holography; further, it is well-known to provide said spacers in order to establish a space to put the index of refraction matching layer seen in Yoshinaga et al.

With regard to claims 9, 12, 16, and 25, the silicone oils of Yoshinaga et al. will intrinsically have an index of refraction that is approximately equal to or within 0.05 of the index of refraction of the inorganic-organic hybrid materials, [0046] and Travnicek values. The silicone oils are chosen to be an index of refraction matching layer, and therefore they will intrinsically satisfy the limitations of the abovementioned claims because when the optical material layer is comprised of more than one material the effective index of refraction will be a weighted average based on the molecular composition of the optical material layer. The silicone oil is chosen to be approximately

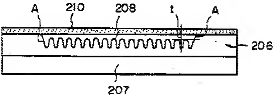
the same as the effective/average refractive index of the optical material layer, which therefore means it will intrinsically be within the minimum and maximum indices of refraction; furthermore, it would have been obvious to one having ordinary skill in the art to vary the individual ratios of all the components in the optical material layer to arrive at an appropriate index of refraction that can be matched by an appropriate index of refraction matching layer.

6. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yoshinaga et al. (JP 01-231082) in view of Chandross et al. (EP 0938027), Loy et al. ("Substituent effects on the sol-gel chemistry of Organotrialkoxysilanes," **2000**, *12*, 3624-3632), and Hiruma et al. (4,863,831) as evidenced by Travnicek (3,996,187) as applied to claim 1 above, and further in view of Inokuchi et al. (5,064,258).

With regard to claim 3, Yoshinaga et al. in view of Chandross et al., Loy et al., and Hiruma et al. as evidenced by Travnicek teach all of the limitations of applicants' claim 1 in section 3 above; however, they fail to teach a spacer layer that is formed between the substrate and the solid component by curing the outer periphery of the optical material layer, the spacer being formed to have a thickness larger than that of an inner portion of the optical material layer.

Inokuchi et al. teach the holographic device of Figure 22.

Fig. 22



The device is comprised of an optical material layer **206**, which has been UV cured in such a way that the edge regions of the optical material layer are thicker than the inner portions (col. 15, lines 42-69).

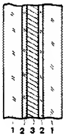
Since Yoshinaga et al. in view of Chandross et al., Loy et al., and Hiruma et al. as evidenced by Travnicek and Inokuchi et al. are all drawn to holographic devices, it would have been obvious to one having ordinary skill in the art at the time the invention was made to incorporate the spacer of Inokuchi et al. into the device of Yoshinaga et al. in view of Chandross et al., Loy et al., and Hiruma et al. The results of such a combination would have been predictable to one having ordinary skill; further, each of the elements would have performed the same in combination as they had separately. The motivation for doing this combination would be to eliminate the step of applying an additional spacer, which is cumbersome, and also it would be cheaper to provide the spacer of the same material as the optical material layer.

7. Claims 5, 10, 13, 17, and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yoshinaga et al. (JP 01-231082) in view of Chandross et al. (EP 0938027), Loy et al. ("Substituent effects on the sol-gel chemistry of

Organotrialkoxysilanes," **2000**, *12*, 3624-3632), Hiruma et al. (4,863,831), and Inokuchi et al. (5,064,258) as evidenced by Travnicek (3,996,187).

With regard to claim 5, Yoshinaga et al. disclose the device of Figure 1.

第 1 図



They disclose an optical component comprised of a holographic film **3**, which is equivalent to applicants' optical material layer, an index of refraction matching fluid **2** covering the holographic film, which may be silicone oil (an organosilicon resin layer), and then a substrate **1** and solid component **1**, which are both glass substrates; however, they do not specifically set forth the materials of the holographic recording layer and they fail to teach a spacer layer that is formed between the substrate and the solid component by curing the outer periphery of the optical material layer, the spacer being formed to have a thickness larger than that of an inner portion of the optical material layer.

Chandross et al. teach an improved holographic recording medium with a hybrid inorganic-organic matrix (Abstract). The matrix precursor is $R_nM(OR`)_{4-n}$ wherein R is an organic moiety such as aryl or alkyl, R` is a lower alkyl up to 4 carbon atoms, n is 1 or 2, and M is Si [0009], [0014]-[0018], and [0022]. The matrix precursor is hydrolyzed

to form the matrix, which reads on applicants' optical material layer and the holographic film of Yoshinaga et al. The organic moieties on the matrix material are disclosed as increasing the free volume/porosity and also increasing compatibility with the photoactive organic monomers, which form the recorded data [0011].

Loy et al. teach the formation of organic/inorganic hybrid materials of the type $RSi(OR`)_3$ where R` is ethyl and R may be a variety of organic groups, including methyl, chloromethyl, and chloromethylphenyl (pg. 3624). The chloromethyl and chloromethylphenyl are shown to react more slowly than the methyl in Table 5 (pg. 3628). The pore diameters for the chloromethyl is significantly larger than that for the methyl substituted silanes as shown in Tables 7 and 8 (pg. 3631). The gels were the most transparent when R was hydrogen, methyl, or chloromethyl (pg. 3631, right column). Loy et al. also disclose that gels may be formed using organotrialkoxysilanes that are typically used for coupling agents (pg. 3632, left column).

Hiruma et al. disclose silane coupling agents that increase adhesion between photocurable coatings and an underlying substrate, including chloropropyl trimethoxysilane (col. 3, line 61 to col. 4, line 66).

Since Otaki et al. Chandross et al., Loy et al., and Hiruma et al. are drawn to inorganic-organic matrix materials; it would have been obvious to one having ordinary skill in the art at the time the invention was made to substitute the known holographic recording materials of Chandross et al. as the recording layer **3** of Yoshinaga et al. The results of which would have been completely predictable to one having ordinary skill in the art of holography; further, Chandross et al. provide a motivation in that their

inorganic-organic hybrid materials are disclosed as increasing the free volume/porosity and also increasing compatibility with the photoactive organic monomers, which form the recorded data [0011].

It would then have been obvious to have replaced the methyltriethoxysilane of Chandross et al. with chloromethyltriethoxysilane as taught by Loy et al. with a reasonable expectation of forming a useful organic-inorganic matrix holographic recording medium based upon the transparency disclosed by Loy et al.; furthermore, it would have been obvious to have used the chloropropyl group in place of the chloromethyl group as taught by Hiruma et al. because they are both recognized as trialkoxysilane coupling agents.

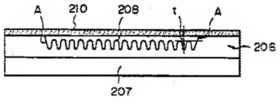
Lastly, one of ordinary skill would understand that an index of refraction liquid of silicone oil would be completely appropriate for the inorganic-organic hybrid recording materials of Chandross et al. as they have similar structural characteristics and would therefore intrinsically have similar indices of refraction. This is further evidenced in Travnicek, which states that various silicone oils are known to have refractive indices of 1.43 to 1.49 (col. 2, line 55 to col. 3, line 9).

With regard to the limitation that the optical material layer has a “thickness unevenness and the organosilicon resin layer is coated on the surface of the dried optical material layer and the total thickness of the organosilicon resin layer and the dried optical material layer is optically uniform,” given the fact that Yoshinaga et al. in view of Chandross et al., Loy et al., and Hiruma et al. disclose the same materials that comprise applicants' optical material layer, and also given the fact that the references

make the optical material layer in the same manner as applicants (i.e. coating on a substrate followed by drying); the Examiner deems the optical material layer of Yoshinaga et al. in view of Chandross et al., Loy et al., and Hiruma et al. will intrinsically display unevenness as claimed. Additionally, the fact that index of refraction matching fluid is present is to correct the wave-like unevenness to optically uniform is an intended use limitation. Intended use limitations are not dispositive of patentability; however, given the fact that Yoshinaga et al. in view of Chandross et al., Loy et al., and Hiruma et al. disclose an optical material layer and the method of making said optical material layer as claimed, and also given the fact that they disclose an organosilicon resin layer as claimed; it is clear to the Examiner that the organosilicon resin layer will perform applicants' intended use.

Inokuchi et al. teach the holographic device of Figure 22.

Fig. 22



The device is comprised of an optical material layer **206**, which has been UV cured in such a way that the edge regions of the optical material layer are thicker than the inner portions (col. 15, lines 42-69).

Since Yoshinaga et al. in view of Chandross et al., Loy et al., and Hiruma et al. as evidenced by Travnicek and Inokuchi et al. are all drawn to holographic devices; it

would have been obvious to one having ordinary skill in the art at the time the invention was made to incorporate the spacer of Inokuchi et al. into the device of Yoshinaga et al. in view of Chandross et al., Loy et al., and Hiruma et al. The results of such a combination would have been predictable to one having ordinary skill; further, each of the elements would have performed the same in combination as they had separately. The motivation for doing this combination would be to eliminate the step of applying an additional spacer, which is cumbersome, and also it would be cheaper to provide the spacer of the same material as the optical material layer.

With regard to claims 10, 13, 17, and 26, the silicone oils of Yoshinaga et al. will intrinsically have an index of refraction that is approximately equal to or within 0.05 of the index of refraction of the inorganic-organic hybrid materials, [0046] and Travnicek values. The silicone oils are chosen to be an index of refraction matching layer, and therefore they will intrinsically satisfy the limitations of the abovementioned claims because when the optical material layer is comprised of more than one material the effective index of refraction will be a weighted average based on the molecular composition of the optical material layer. The silicone oil is chosen to be approximately the same as the effective/average refractive index of the optical material layer, which therefore means it will intrinsically be within the minimum and maximum indices of refraction; furthermore, it would have been obvious to one having ordinary skill in the art to vary the individual ratios of all the components in the optical material layer to arrive at an appropriate index of refraction that can be matched by an appropriate index of refraction matching layer.

Double Patenting

8. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

9. Claims 1-6, 8-13, 15-17, 19, 25, 26, and 29 are directed to an invention not patentably distinct from claims 1, 2, 4-6, 8, and 10-16 of commonly assigned 10/563815. Specifically, see section 10 below.

The U.S. Patent and Trademark Office normally will not institute an interference between applications or a patent and an application of common ownership (see MPEP Chapter 2300). Commonly assigned Application No. 10/563815, discussed above, would form the basis for a rejection of the noted claims under 35 U.S.C. 103(a) if the commonly assigned case qualifies as prior art under 35 U.S.C. 102(e), (f) or (g) and the conflicting inventions were not commonly owned at the time the invention in this

application was made. In order for the examiner to resolve this issue, the assignee can, under 35 U.S.C. 103(c) and 37 CFR 1.78(c), either show that the conflicting inventions were commonly owned at the time the invention in this application was made, or name the prior inventor of the conflicting subject matter.

A showing that the inventions were commonly owned at the time the invention in this application was made will preclude a rejection under 35 U.S.C. 103(a) based upon the commonly assigned case as a reference under 35 U.S.C. 102(f) or (g), or 35 U.S.C. 102(e) for applications pending on or after December 10, 2004.

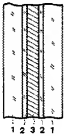
10. Claims 1-6, 8-13, 15-17, 19, 25, 26, and 29 provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1, 2, 4-6, 8, 10, and 12-16 of copending Application No. 10/563815 in view of Yoshinaga et al. (JP 01-231082), Inokuchi et al. (5,064,258), and Penn (3,897,995).

Although the conflicting claims are not identical, they are not patentably distinct from each other because the current application is broad enough to allow for the photopolymerizable compound and non-halogen organic group metal alkoxide of copending claim 1, and also the limitations of claims 4-6 and 12-16. The current application and the copending application are both drawn to an optical material layer or hologram recording material that is comprised of a metal alkoxide compound having a halogen-containing organic group (pending claims 1, 4, and 5 with copending claim 1) wherein that halogen-containing organic group is a chloropropyl group (copending claim 10). Both the pending and copending application are drawn to optical components,

wherein the copending hologram recording medium of claim 8 reads on the pending optical component; however, the copending claims do not disclose presently claims substrate, organosilicon resin layer that is a refractive index matching layer, and a solid component stacked on the organosilicon resin layer.

Yoshinaga et al. disclose the device of Figure 1.

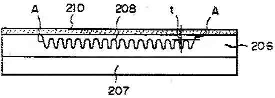
第 1 図



They disclose an optical component comprised of a holographic film **3**, which is equivalent to applicants' optical material layer, an index of refraction matching fluid **2** covering the holographic film, which may be silicone oil (an organosilicon resin layer), and then a substrate **1** and solid component **1**, which are both glass substrates.

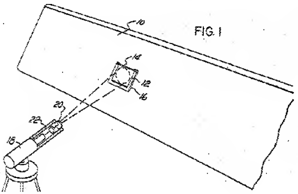
Inokuchi et al. teach the holographic device of Figure 22.

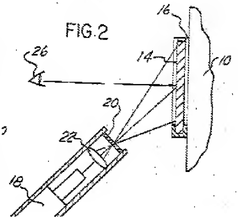
Fig. 22



The device is comprised of an optical material layer **206**, which has been UV cured in such a way that the edge regions of the optical material layer are thicker than the inner portions (col. 15, lines 42-69).

Penn teaches the device of Figure 1 and 2.





The holographic recording material has a spacer **16** that is thicker than the optical material layer **14** and separates the substrate **12** and the solid component **10**. It is clear that it is thicker than the optical material layer from the Figure 2, and also from the disclosure at col. 3, lines 52-67. The spacer surrounds the optical material layer on the outer periphery thereof.

It would have been obvious to one having ordinary skill in the art to have used the index of refraction matching fluid **2**, substrate **1**, and solid component **1** of Yoshinaga et al. because it would have lead to a holographic recording medium that would have had less scattering due to the presence of an index of refraction matching layer.

Given the fact that the materials present in the optical material layer and the organosilicon resin layer are identical to that claimed and disclosed, the Examiner

deems that this combination will intrinsically meet the limitations that the optical material layer is "uniform" of claim 1, as well as the refractive index limitations of claims 6, 8, 11, and 15; furthermore, the silicone oils are chosen to be an index of refraction matching layer, and therefore they will intrinsically satisfy the limitations of the abovementioned claims because when the optical material layer is comprised of more than one material the effective index of refraction will be a weighted average based on the molecular composition of the optical material layer. The silicone oil is chosen to be approximately the same as the effective/average refractive index of the optical material layer, which therefore means it will intrinsically be within the minimum and maximum indices of refraction; furthermore, it would have been obvious to one having ordinary skill in the art to vary the individual ratios of all the components in the optical material layer to arrive at an appropriate index of refraction that can be matched by an appropriate index of refraction matching layer.

It would also have been obvious to have incorporated either of the spacer materials of Inokuchi et al. or Penn in the holographic recording medium of the copending application for the reasons set forth in sections 5 and 7 above. These spacers meet pending claims 2, 3, 4, 5, and 29. This also renders obvious claims 9, 10, 12, 13, 16, 17, 25, and 26 for the same reasons defined in the immediately preceding paragraph.

This is a <u>provisional</u> obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

Response to Arguments

11. Applicant's arguments with respect to claims 1-6, 8-13, 15-17, 19, 25, 26, and 29 have been considered but are moot in view of the new ground(s) of rejection.

Applicants have amended independent claims 1, 4, and 5 to include the specific inorganic-organic matrix material chloropropyltriethoxysilane, which will be hydrolyzed to form the optical material layer. This has required the Examiner to perform further search on this compound, and it also necessitated the obviousness-type double patenting rejection set forth in section 10 above.

The Examiner suggested in the Interview summary mailed 09/25/2009 that Otaki et al. suggest the use of a chloropropyl substituent at [0036]; however, after consultation with the translations branch at the USPTO this was found to have not been the case.

Conclusion

12. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The Examiner notes the search history and content of case 10/563815, which has a common inventor to the instant application and also US 2003/0195321.

13. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to GERARD T. HIGGINS whose telephone number is (571)270-3467. The examiner can normally be reached on M-Th 10am-8pm est. (Friday off).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mark Ruthkosky can be reached on 571-272-1291. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a

USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Mark Ruthkosky/
Supervisory Patent Examiner, Art Unit 1794

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Examiner
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